INVENTORY OF AVIAN SPECIES WITHIN NATIONAL PARKS OF THE MID-ATLANTIC & COASTAL AND BARRIER NETWORKS

A proposal submitted to the National Park Service

by the

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BACKGROUND: In 1991, the National Park Service published its plan to protect natural and cultural resources within service lands. Among other things, the plan calls for park managers and superintendents to have access to solid information about natural resources occurring on lands under their direction. The plan points out that reliable scientific information is central to maintaining ecosystem integrity. The Natural Resource Inventory and Monitoring Program that emerged from this plan is centered around five long-term goals. The first of these goals is to complete baseline inventories of natural resources on all park lands.

As part of this effort, The Center for Conservation Biology proposes to develop the avian data sets for selected national parks within both the Mid-Atlantic and the Coastal and Barrier Networks. Specifically, this work will involve data mining, compilation, and field work to produce desired inventories and associated data and will be partitioned relative to Park Network and objectives according to the following four tasks.

Task 1. Conduct baseline avian inventories at five Mid-Atlantic Network Parks:

Appomattox Court House National Historic Site
Booker T. Washington National Historic Site
Fredericksburg and Spotsylvania National Military Park
Petersburg National Battlefield Park
Richmond National Battlefield Park

Task 2. Conduct baseline avian inventories at three Coastal and Barrier Parks:

Colonial National Historical Park
George Washington's Birth Place National Monument
Thomas Stone National Historic Site

Task 3. Conduct data mining, compilation, and database entry of avian species information collected at Assateague Island National Seashore. Identify additional inventory gaps for either specific guilds or species.

Task 4. Conduct baseline terrestrial bird inventory for Assateague Island National Seashore.

OBJECTIVES: There are three interrelated objectives of the inventory and monitoring program. These include:

1. Document through existing data or targeted fieldwork, at least 90% of the predicted species of birds currently estimated to occur on park lands.
2. Describe the distribution and relative abundance of species of special concern, such as Threatened and Endangered species, exotic and other species of special management interest occurring within park boundaries.
3. Provide the baseline information needed to develop a general monitoring strategy and design that can be implemented by parks once inventories have been completed.

These objectives are realistic although will require extensive effort within the mid-Atlantic region to accomplish. The geographic position of this region predisposes it to an extremely diverse and dynamic avifauna component. More than 75% of the species that breed here are migratory and 25% reach their northern or southern range limits within the region. This points to an avifauna in constant transition, with great variability in residence times and times of passage for migrants. Coastal parks are particularly subjected to extreme events in bird movements during migration due to the bottleneck effects of land masses at Cape May and Cape Charles. In winter, the mid-Atlantic region appears to be the northern threshold for temperate migrants, harboring most of the representative short-distance migrants that breed to the north. These short-distance visitors often completely overshadow the resident bird community in certain habitats.

To successfully meet a goal of documenting 90% of the avifauna will demand extensive, repeated surveys during all seasons of the year, and throughout the complete spectrum of habitats. Although volunteers can accomplish some of this, this project will require at least a core of professional technicians to adequately address some of the more sensitive habitats and species.

METHODOLOGY

Information Mining

A) Historical Records

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An initial effort will be made to retrieve and compile historical data for the respective parks. This will include published records as well as archived information from state and local bird groups and local universities. Additional data will be gleaned from Breeding Bird Survey data, Christmas Bird Counts, and other reliable annual or periodic surveys. Some of the coastal parks will have aerial survey data from colonial waterbird, eagle, and/or waterfowl surveys which can be accessed as well. A request will also be sent out to the bird watching community to request documented occurrences from personal records.

B) Developing an "expected" species list

Range maps, atlas data, and other information resources will be used to develop an expected list of birds for each park. Staff members within the Center for Conservation Biology have conducted extensive research throughout virtually every habitat within the mid-Atlantic region. This expertise will be used to develop lists of expected species by habitat. Survey results can then be used to generate an accumulation curve to see when documented species begin to approach expected totals. This can also be used to highlight gaps in species coverage that can be corrected during the survey period.

Site evaluation and set-up

Color infrared digital orthophoto quarter-quadrangles (DOQQs) will be used along with park resources and site visits to delineate unique habitat types and patch boundaries. Habitats will be identified and segregated according to predominant cover type and/or structure as follows: cropland/agricultural; grassland; scrub/shrubland; young plantation; mature pine ($\geq$ 75%); mature hardwood ($\geq$ 75%); mixed forested; forested wetland; scrub/shrub wetland; emergent wetland; salt marsh; dune; beach; open water; and developed/recreational.

Because of the predominance of upland habitats within the majority of the parks to be sampled, a standardized point count methodology will be the preferred technique used for sampling. Points will be located a minimum of 250 meters apart and established according to the following size criteria:

Patch size	Number of sample points
< 10 ha.	1 point
10 – <30 ha	2 points
30 – <100 ha	4 points
$\geq$ 100 ha	8 points

Once established, a portable GPS unit will be used to log the coordinates of each sample point. These points will be loaded into ArcView for projection onto DOQQs to ensure adequate habitat representation across the park unit.

Sampling techniques

The targeted parks within the two park networks to be sampled share several common features. One of the most significant is that much of the land area is comprised of small units of land separated by long distances or linked by a narrow corridor. This configuration makes a randomized sampling grid less practical because of the likelihood of missing small habitat patches. Because many bird species exhibit high affinities for specific habitats, it is important that all available habitats be surveyed within each park.

Spring /Summer – For all upland habitat types, a stratified point count technique will be used to measure bird density and occurrence during spring migration and breeding season. At this time of year birds tend to be highly vocal and active, making them easy to detect from a fixed point. Sample points will consist of a 50 meter radius circle with a wire flag at the center. An observer will stand at the center and record all birds seen or heard. The count period will be for 10 minutes. This time interval is preferred where travel time between points is long, or where the number of points within a patch is small. The count period will be subdivided into a 3 minute period, a 2 minute period, and a five minute period. This will allow for better comparison of the data with other survey efforts. Birds detected within the 50 meter circle can be used to calculate density estimates where desired. Birds recorded beyond the 50 meter perimeter will be tallied for the overall species list.

There will be five surveys during the spring/summer period which will run from April 1 through July 15. Three of these will be conducted during the first two months to achieve better coverage of the migration period. The final two will occur in June and July to resolve the breeding bird assemblages.

Fall/Winter – The same point count methodology will be used for upland forested systems in the fall and winter as in the summer. However, for grassland /early successional upland sites we will use a strip transect technique to maximize bird detection. During the nonbreeding seasons birds tend to be quieter and more focused on foraging activities and predator avoidance making them difficult to detect. For this reason, a strip transect allows the observer to cover more ground increasing the probability of flushing cryptic species, or species in dense cover that would otherwise be missed. Each transect will consist of a center-line bisecting a 50 meter wide band of habitat. All birds detected within the 50 meter band can be used to calculate density estimates. Birds beyond the band will be tallied toward the overall species list. In order to detect species more inclined to use the interior of grassland sites as well as the opportunistic “edge” species, transects will be paired. For each patch of suitable size, an “edge” transect will be established running parallel to, and adjacent to, the patch border. Conversely, an “interior” patch will be established through the center of grassland sites in order to detect grassland or open-land obligate species that prefer the most isolated areas of the patch. Strip transects will be established in lengths relative to patch size as follows:

Patch size	Transect Length
<10 ha	100 m
10 - < 30 ha	200 m
30 - <100 ha	400 m
$\geq$ 100 ha	800 m

Fall and winter surveys will be conducted 5 times between September 1 and March 1. Three of the surveys will be carried out during the principal migration period between August 15 and November 15. The other two surveys will be conducted between January 1 and March 1.

Guild or habitat-specific surveys – There are specific groups of birds that are not well represented in standard breeding bird surveys due to their specific activity periods, or habitat associations. Among these are water birds, raptors, and all nocturnal species. We will conduct specific surveys for these groups within the appropriate season and habitat as warranted. A number of techniques may be used. Colonial waterbirds, many shorebirds, and most large raptors are most easily surveyed by air. Many of these parks fall within the flight zone of aerial surveys routinely conducted by The Center for Conservation Biology and this information would again be accessible by that means. For nocturnal species, tape playbacks are most effective and can normally be used with good success at appropriate times of the year. For rails and other secretive waterbirds, tape playbacks can be used effectively in marsh habitats during the breeding season and during migration. Waterfowl are also best detected by air, but can also be surveyed from stationary points along a shoreline that affords good visibility. At least one park contains habitat suitable for a critically endangered species in Virginia (Red-cockaded Woodpecker) and may involve a more focused survey effort on foot in that area. All of these techniques will be employed as appropriate during the course of the project to assist in identifying more of the rare and special concern species, as well as helping to generate a more complete overall species list. Techniques to be used will be identified as each project task is discussed.

PROJECT MANAGEMENT

Coordination

This project will make use of one project coordinator who will serve as the primary contact with NPS and oversee all project management. Three field technicians will be hired to conduct survey work. Their effort will be supplemented with volunteers where available. Volunteers are particularly effective for certain field projects where 1) there is a large resource base to draw from; 2) field sites are geographically widespread; 3) habitats are relatively benign; and 4) there is an efficient mechanism for coordination in place. All of these criteria are met here. We propose to develop a web component for advertising and registering volunteers for field work. Paid field techs will set-up the survey points, conduct most guild or habitat specific surveys for sensitive species, and conduct most of the point counts. Volunteers will be solicited to assist predominantly during the migration seasons to conduct point counts and generally help to boost species detections. One part-time data entry technician will be hired to assist in data management and web maintenance.

Each invidual park will be provided with a survey plan for that park before surveys begin. The plan will outline sampling methods, timetable, and framework for completion. Contact information will be exchanged and used routinely to notify park staff of survey dates and pertinent issues regarding access or assistance requested from parks.

Deliverables

The NPS Inventory and Management Program has a standardized list of specifications for information documentation and submission. All information will be managed in a manner that conforms to these specifications. This includes:

a.) Digital data sets produced in Microsoft Access 2000 and using the NPS I&M template.
b.) Corrected GPS coordinates provided in either ArcInfo format (preferred) or as an ArcView shapefile.
c.) Metadata will be properly registered and provided as requested in an approved format.
d.) Species documentation by photo where possible, or by salvage. Federal laws prohibit the taking of migratory birds.

Reports

Digital progress reports will be submitted semi-annually. A draft final report will be provided digitally as well, with the final report distributed in both digital and hard copy.

Timetable

Oct – Dec 2002	Begin historical records research and compilation to continue throughout project. Review digital imagery and begin site set-ups. GPS points. Produce survey plan and meet with individual park contacts. Hire field and data techs.
Jan – March 2003	Conduct winter bird surveys. Establish and populate database. Advertise for volunteers for spring work.
April – July 2003	Conduct spring migration and breeding season surveys. Manage database.
August – Nov 2003	Establish and GPS strip transects. Conduct fall migration surveys.
Dec 2003 – Feb 2004	Complete data sets, review metadata and format standards; analyze information; submit draft report
March 2004	Submit final report

The following scope of service and budget information is being provided per Park Network according to previously identified tasks. Scope of service assumes that project description and methodologies follow those already discussed.

Task I. Mid-Atlantic Parks Avian Inventory

Park		# Units	Total Area (ha)
Appomattox Court House NHS	(APCO)	1	705
Bookert T. Washington NHS	(BOWA)	1	91
Fredericksburg /Spotsylvania NMP	(FRSP)	9	2747
Petersburg National Battlefield Park	(PETE)	10	1271
Richmond National Battlefield Park	(RICH)	11	309

SCOPE OF SERVICE: The Center for Conservation Biology will coordinate and conduct all aspects of the inventory of birds on the selected parks listed within the mid-Atlantic Network. Results of the inventory will be reported in a manner consistent with the specifications outlined in the National Park Service Product Specifications document.

Specifically, standardized survey techniques will be carried out as described earlier in all habitat types in each park unit. Unique to this association of parks will be the following guild, or habitat specific surveys:

1) Wading bird colonies and bald eagle nests in association with FRSP, PETE, and RICH will be surveyed by fixed wing aircraft during the breeding season for those species respectively. This will be carried out as part of a larger Coastal Plain-wide effort that the Center will be involved with. There will be two surveys for bald eagles, during which wading bird colonies may be located and mapped as well.

2) Nocturnal surveys will be conducted on two nights in the spring and early summer for owls and nightjars. Observers will use tape playbacks intermittent with listening periods for 10 minutes at designated sample points within, or adjacent to, forested habitats. This will be coordinated with local NPS staff and carried out by paid project staff rather than volunteers.

BUDGET - FY 2003 and 2004

Budget Category	W&M Contribution	Requested Funds FY 2003	Requested Funds FY 2004
A. Personnel			
Salary/wages	$2000	$25,380	$13,050
Benefits	$540	$5,134	$3,030
B. Travel		$3,575	$975
C. Lodging		$600	$120
D. Equipment		$500	
E. Supplies		$300	$200
F. Total Direct Cost			
Costs (a-e)		$35,489	$17,375
G. Indirect Cost		$8,747	$4,344
H. Total Cost	$2,540	$44,236	$21,719

BUDGET NARRATIVE - FY 2003

A. This project will require 1 coordinator to hire and manage two field technicians to conduct surveys, work with volunteers, develop survey approaches, manage information and report inventory findings. An estimated 5.5 months of work will be required on project objectives for FY 2003 at a salary of 3K/month. Field technicians will be paid $120/day to assist project manager with site set-up, and $15/hour for survey work. We estimate site set-up to take 9 days. We estimate site surveys to require 80 person/days x 4.5 hours/day x $15/hour. In addition, 1 project technician will be employed part-time for 2 months at $1200/month during FY 2003 to assist with data entry, volunteer coordination and web maintenance. Fringe Benefits for coordinator calculated as 27% of salary. Fringe benefits for technician are calculated at 7.65% for FICA. Center staff will contribute $2000 in time for the costs of two observers, pilot and plane for a pro-rated portion of the annual bald eagle survey across the Coastal Plain of Virginia.

B. Mileage for projects estimated to be 11,000 miles ($0.325/mi).

C. Estimated lodging at $12 nights at $50 per night.

D. Two portable GPS units will be purchased for establishing survey points, recording unique sightings/locations, or endangered species points of encounter.

E. Office supplies, copying and other misc. costs estimated to be $300.

G. Indirect cost figure represents rate of 25% established per Cooperative Agreement 4000-8-9030 between NPS and the College of William and Mary.

BUDGET NARRATIVE - FY 2004

A. This fiscal year will require 1 coordinator to manage two field technicians to conduct surveys, work with volunteers, manage information and report inventory findings. An estimated 3.5 months of work will be required on project objectives for FY 2004 at a salary of 3K/month. Field technicians will be paid $15/hour for survey work. We estimate site surveys to require 20 person/days x 4.5 hours/day x $15/hour. In addition, 1 project technician will be employed part-time for 1 months at $1200/month during FY 2004 to assist with data entry, and web maintenance. Fringe benefits for coordinator calculated as 27% of salary. Fringe benefits for technician are calculated at 7.65% for FICA.

B. Mileage for projects estimated to be 3,000 miles ($0.325/mi).

C. Estimated lodging costs should not exceed $120.

E. Office supplies, copying and other misc. costs estimated to be $200.

G. Indirect cost figure represents rate of 25% established per Cooperative Agreement 4000-8-9030 between NPS and the College of William and Mary.

Task 2. Coastal and Barrier Network Avian Inventory

Park	# Units	Total Area (ha)
Colonial National Historical Park (COLO)	3	3804
George Washington's Birth Place NM (GEWA)	1	223
Thomas Stone National Historic Site (THST)	1	133

SCOPE OF SERVICE: The Center for Conservation Biology will coordinate and conduct all aspects of the inventory of birds on the parks listed within the Coastal and Barrier Network. Results of the inventory will be reported in a manner consistent with the specifications outlined in the National Park Service Product Specifications document.

Specifically, point counts and other techniques will be carried out as described earlier in all habitat types in each park unit. Unique to this park cluster will be the following guild, or habitat specific surveys:

1) Nocturnal surveys will be conducted on two nights in the spring and early summer for owls and nightjars at all parks. Observers will use tape playbacks intermittent with listening periods for 10 minutes at designated sample points within, or adjacent to, forested habitats. This will be coordinated with local NPS staff and carried out by paid project staff rather than volunteers.

2) Wading bird colonies and bald eagle nests in association with COLO will be surveyed by fixed wing aircraft during the breeding season for those species respectively. The eagle survey will be carried out as part of a larger Coastal Plain-wide effort that the Center will be involved with. The wading bird colonies can also be surveyed by air at the same time, but may require ground-truthing to ascertain specific colony size and species assemblages.

3) There will be a focused survey in the northeastern unit of COLO to investigate the possible presence of endangered Red-cockaded Woodpeckers. This will require one observer conducting a one-time survey by walking parallel transects through the mature pine components of the forest stand to search for Red-cockaded Woodpecker cavities. Tape playbacks of the species vocalizations may be used intermittently as well to elicit a response from potential birds in the area.

4) Nocturnal and early morning surveys will be carried out on 3 nights during the early spring and summer and 3 nights in fall and early winter along the brackish marsh habitats of Jamestown Island and discrete isolated marshes along the Colonial Parkway at COLO and suitable habitats at GEWA for rails. This will involve tape playbacks of candidate species that might be expected to occur in the area at those times.

5) Waterfowl stations will be established at fixed points along the Colonial Parkway, Jamestown causeway, and other discreet marsh and open water habitats within COLO, as well as wetland and open water habitats associated with GEWA. From these points observers will scan and record observed waterfowl during days when point counts are underway.

BUDGET - FY 2003 and 2004

Budget Category	W&M Contribution	Requested Funds FY 2003	Requested Funds FY 2004
A. Personnel			
Salary/wages	$1,500	$21,660	$6,510
Benefits	$405	$4,850	$1,277
B. Travel		$1,462	$488
C. Lodging		$300	$100
D. Equipment			
E. Supplies		$200	$100
F. Total Direct Cost			
Costs (a-e)		$28,472	$8,475
G. Indirect Cost		$7,118	$2,119
H. Total Cost	$1,905	$35,590	$10,594

BUDGET NARRATIVE - FY 2003

A. This project will require 1 project coordinator to hire and manage 1 field technician, work with volunteers, develop survey approaches, manage information and report inventory findings. An estimated 4.5 months of work will be required on project objectives for FY 2003 at a salary of 3K/month. Field technician will be paid $120/day for site set-up and $15/hr for survey work. Site set-up is estimated at 6 days, and 6 days are projected for each survey round, with 8 surveys in FY 2003. Field tech will also assist project coordinator in guild, or habitat specific surveys. One additional technician will be hired part-time at $1200/month for 1 month to assist with data entry and maintenance. W&M will contribute time of two observers and cost of plane and pilot for two aerial surveys for bald eagles and wading birds.

B. Fringe Benefits for coordinator calculated as 27% of salary. Fringe benefits for technicians are calculated at 7.65% for FICA.

C. Mileage for projects estimated to be 4,500 miles ($0.325/mi).

D. Estimated lodging includes 6 overnight stays ($50/night).

F. Office supplies, copying and other misc. costs estimated to be $300.

G. Indirect cost figure represents rate of 25% established per Cooperative Agreement 4000-8-9030 between NPS and the College of William and Mary.

BUDGET NARRATIVE - FY 2004

A. This project will require 1 coordinator to manage 1 field technician, work with volunteers, manage information and report inventory findings. An estimated 1.5 months of work will be required on project objectives for FY 2004 at a salary of 3K/month. The field technician will conduct 2 survey rounds in FY 2004 at 6 days per round. In addition, 1 project technician will be employed part-time for 1 month to assist with data entry, report production.

B. Fringe Benefits for coordinator calculated as 27% of salary. Fringe benefits for technician are calculated at 7.65% for FICA.

C. Mileage for projects estimated to be 4,500 miles ($0.325/mi).

D. Estimated lodging includes 6 overnight stays ($50/night).

F. Office supplies, copying and other misc. costs estimated to be $300.

G. Indirect cost figure represents rate of 25% established per Cooperative Agreement 4000-8-9030 between NPS and the College of William and Mary.

Task 3. Data mining, compilation and database entry of avian species information collected at Assateague Island National Seashore, with further identification of inventory gaps for either specific guilds or species.

SCOPE OF SERVICE: The Center for Conservation Biology will coordinate and conduct a comprehensive effort at researching and compiling existing data on the avifauna and associated information for Assateague Island National Seashore. This will include a thorough review of published literature and archived records from pertinent sources. Local universities, bird clubs, and conservation organizations will be contacted for information as well as recognized members of the ornithological citizen community. State and federal records will be researched for data on regional surveys that include waterfowl, colonial nesting birds, and bald eagles. Historical surveys including Breeding Bird Surveys and Christmas Bird Counts will be examined as well.

The results of this effort should yield a database containing records for the majority of birds known to occur at Assateague Island NS. There will most likely be gaps for documentation on reclusive, or habitat-specific species that are overlooked during most standardized surveys. These gaps should form the basis for a targeted survey effort to complete the avifauna profile for Assateague. Product deliverables will therefore include a database of historical records; an "expected" avifauna list; and a recommended survey protocol to reconcile the differences between what would be expected there and what has been documented.

BUDGET: FY 2003

Budget Category	**Requested Funds FY 2003**
A. Personnel	
Salary/wages	$2,700
Benefits	$497
B. Travel	$488
C. Lodging	$150
D. Equipment	
E. Supplies	
F. Total Direct Cost	
Costs (a-e)	$3,835
G. Indirect Cost	$ 959
H. Total Cost	$ 4,794

BUDGET NARRATIVE - FY 2003

A. Personnel costs include project coordinator for ½ month at 3K/month plus one technician to assist in research and compiling information for 1 month at $1200/month.

B. Travel estimated at approximately 1500 miles at $.325/mile.

C. Lodging is estimated at $150.

G. Indirect cost figure represents rate of 25% established per Cooperative Agreement 4000-8-9030 between NPS and the College of William and Mary.

Task 4. Baseline terrerstrial bird inventory for Assateague Island National Seashore

SCOPE OF SERVICE: Contingent on results of Task 3. Pending at this time.